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1. Your reference — ACR/SH/57592

2. Patent application number *(The Patent Office will fill in this part)* — 12 FEB 1999 — **9903317.7**

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

James REDDING
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Surrey

dl 8.3.99

Patents ADP number *(if you know it)* 7602493001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention — SECURITY UNIT

5. Name of your agent *(if you have one)* — LLOYD WISE, TREGEAR & CO

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

COMMONWEALTH HOUSE
1-19 NEW OXFORD STREET
LONDON WC1A 1LW

Patents ADP number *(if you know it)* — AL002 117001

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Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

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11. I/We request the grant of a patent on the basis of this application

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12. Name and daytime telephone number of person to contact in the United Kingdom

STEVEN HOWE
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SECURITY UNIT

The present invention relates to a security unit or box, and in particular to a security unit for storing securely cash, cheques and/or credit and debit card slips or vouchers, and to a feed system for handling items which may be used within such a unit. The invention also relates to a bag for use within such a unit.

Retail outlets usually have one or more tills provided at sale points on the shop floor. The tills include a till drawer which stores a float from which change may be given to customers. As transactions are completed, the payments tendered by customers are added to the till drawer. Accordingly, the amount of cash together with cheques, credit and debit card slips and coupons will increase in the till drawer. This is a potential security risk as the contents in the till drawer are very vulnerable to theft. This is especially the case as the till drawer is opened for every transaction. Therefore, a thief may attempt to snatch the contents of the till drawer when the drawer is opened. There is also the risk that the till operator will unlawfully remove money from the till drawer.

In an attempt to mitigate this risk, it is known for cash to be removed periodically from the till. This cash is typically removed in unknown quantities.

The cash removed may be taken, for example by a supervisor, from the shop floor to a cash room within the store. This still presents a security risk as there may be a large amount of money in the till drawer at certain times, in particular shortly before the cash is to be removed, and at this time the money is vulnerable to theft as described above. Further, whilst the money is carried from the shop floor, the money is again vulnerable.

In an alternative system, it is known to provide a link from each of the sale points to the cash office by a transportation means, for example an air duct. Money is removed from the till periodically, placed in a canister having dimensions similar to that of the air duct, and the canister is transported through the air duct to the cash room by air pressure in the duct behind the canister. This is an improvement compared to the money being carried by a person over the shop floor as the money is less vulnerable to theft when passing through the air duct since there is no direct access to the duct. However, the problem of a large amount of money being retained in the till where it is vulnerable to theft at certain times is not avoided.

It is therefore known to provide a secure box, typically of metal with a high security lock, at each sale point. The box incudes an opening through which notes, cheques and slips can be introduced. The box often includes a separate, removable inner box, for example a glass fibre box, into which the notes or the like are deposited. When the secure box is opened, which may be after the store has closed, the glass fibre box is removed as a single item and taken off the shop floor for processing. In this case, notes may either be introduced to the secure box as they are received or, more usually, a number of notes are introduced into the box when the till becomes too full.

A problem with such known secure boxes of this type is that the amount of money contained in them is not known, and therefore there is still a problem that a member of staff may take money either before this is introduced to the box or after the money has been introduced to the box.

A further problem where the content of the secure box is not known is that the contents of the box must be removed and counted. This introduces a further money handling step where there is a security risk.

Another problem with conventional money handling systems, including known security boxes, is the conveying or transportation of notes without the risk of jamming or damaging of the notes. Most conventional note handling systems rely either on gravity to cause the notes to drop into a required position, or on a driven system of opposed endless belt conveyors or rollers which nip the notes and drive these to the required position. The problem with a gravity based system is that it is easy for the notes to become jammed, thereby preventing further notes being added. A driven system using endless belts or rollers is also susceptible to jamming, and may also tear or otherwise damage the notes.

According to a first aspect of the present invention, a conveying system comprises a channel through which items are to be conveyed, opposed side walls of the channel including a plurality of fluid inlets inclined to the angle at which the items are to be conveyed, and through which fluid from outside the channel is jetted to produce a generally laminar fluid flow through the channel which entrains an item to convey this through the channel.

With the conveying system according to the present invention, items such as, but not limited to, notes, cheques, credit and debit card slips and other papers are conveyed through a channel without significant risk of these jamming or being damaged. The notes or other items do not contact any solid component of the channel, and therefore there is reduced risk of these becoming jammed within the channel as compared to a system using endless belts or rollers. Further, as there is no solid, physical means contacting and pulling the items to be conveyed, there is a reduced risk of the item being pulled, stretched or torn. This transportation system is distinguished from known air duct systems which rely on a high air pressure behind the item to be transported, and as such rely on the

item being pushed rather than the item being entrained. This is particularly advantageous as the present invention allows thin, generally flat items, especially where these are flexible, to be conveyed. This is not possible in a system relying on fluid pressure to drive the items from behind, in which case the items do not have sufficient surface area on which the pressure can be applied. Flexible items tend to fold under pressure and may therefore jam. By jetting fluid from opposed sides of the channel, especially where the fluid is jetted along the length of the channel, the items to be transported are maintained generally flat.

The openings may be in the form of an array of holes, for example circular or oval holes, much like a cheese grater. The fluid will jet through these holes to convey the note. Alternatively, the openings may be in the form of elongate slots extending substantially across the width of the channel. An associated fluid guide or baffle may be provided to direct the jet of fluid into the channel. The advantage of slots is that the area through which the fluid enters the channel is larger, giving a greater volume of fluid to convey articles through the channel. Nevertheless, the resulting velocity of the fluid flow will be lower compared to that where holes are used.

It is preferred that the fluid jetted through the openings is a gas, and more particularly that the fluid is air. By conveying the item or items through the channel using a gas jet, the item or items will not be wetted as would be the case were a liquid is used as the fluid conveying medium. The use of air as the gas is advantageous as this may be provided to the channel merely by providing a fan or blower to blow the ambient air without requiring a separate gas supply. Alternatively, a separate source of pressurised gas may be provided.

Where heavy items are to be conveyed by the conveyor, it may be necessary to use a fluid having a high density, for example a liquid, to support and convey the items.

The openings into the channel are preferably angled with respect to the longitudinal plane passing through the channel and to the plane normal to the channel. In this way, the fluid from a high fluid pressure region around the channel is jetted into the channel to give components of fluid flow extending generally normal to the opposed faces of the channel, and components passing longitudinally through the channel. In this way, the item to be conveyed will be suspended between the opposed, typically upper and lower, faces of the channel by the generally normal component of the fluid entering the channel through the openings. This keeps the items flat and spaced from the walls of the channel to prevent jamming or damage.

The channel preferably has a generally oval cross-sectional channel in a plane generally perpendicular to that along which the items are conveyed. This shape is found to give improved fluid flow characteristics and therefore improved conveying properties compared to a rectangular channel.

Especially where the items to be conveyed are bank notes, cheques or card slips, the channel preferably has a width of about 90mm, a height of about 20mm and a length of about 95mm. Where the openings are holes, these are preferably spaced in rows extending across the width of the channel. Preferably, adjacent holes in each row are spaced by 20mm, with adjacent rows being spaced by 10mm with a 10mm offset between holes in adjacent rows. Each hole preferably has a diameter of about 5mm to allow sufficient fluid to pass through the hole at a sufficiently high velocity to convey the items. The number and size of holes will be dependent on the size of the channel, the fluid used to convey the

items and the nature of the items to be conveyed, in particular their size and weight.

The openings are advantageously formed at an angle of about 45° to the channel. In this way, the component of the fluid flow flowing normal to the opposed faces of the channel is between about 10 and 20%, more preferably between 10 and 15% of the overall fluid flow and the remaining component of the fluid flow is in the direction in which the items are to be conveyed.

The holes are beneficially formed through a dimple in the surface of the channel. In this case, the dimple may be formed either into or out of the channel. Where the dimple is formed into the channel, the dimple is formed behind the hole in the direction in which the item is to be conveyed. Where the dimple is formed out of the channel, the dimple is formed in front of the hole in the direction in which the item is to be conveyed.

The channel may be made of sheet material, such as metal. In this case, it is preferred that the openings are formed in the flat sheet which is then bent to form the channel. Alternatively, the channel may be moulded. This is a particularly suitable method of manufacture where the channel is made from a plastics material.

The channel is advantageously provided within and communicates with a duct in which high pressure fluid is provided.

According to a second aspect of the present invention, a security unit comprises a secure, lockable housing including an inlet for items to be stored and a removable package provided within the housing, the unit being arranged so that the removable package is sealed in a

tamper evident manner before the removable package can be removed from the housing.

With the security unit according to this aspect of the invention, items introduced into the unit through the inlet are stored in a package which is removable allowing the stored items to be removed from the secure unit in a single unit for ease of transportation and processing. As the package cannot be removed until this has been sealed in a tamper evident manner, any attempt to violate the package, for example to remove items contained within the package, will be evident. This gives a significant improvement in security compared to the prior art systems.

It is preferred that items introduced to the secure unit are conveyed to the package by a fluid conveying means in accordance with the first aspect of the present invention, although it will be appreciated that other conveying means, such as a gravity feed or a driven conveyor with endless belts or rollers may be used. The conveying means may be dependent on the item to be stored.

It is preferred that the security unit includes an identification and/or validation means between the inlet and the removable package. In this way, the items which are introduced to the package can be identified and/or validated. This improves security as the content of the package is known accurately. The identification and/or validation of the items may advantageously be stored in a memory. This can be used as a list of the items contained within the removable package. In this case, it is preferred that the removable package is identifiable, for example with a unique identification such as a bar code printed on or embedded in the removable package. This allows the stored contents of the removable package to be associated with the removable package at a later date. This is especially useful for balancing a till, for example

for comparing the takings with till receipts or from Electronic Point of Sale (EPOS) records.

The identification may be stored in a chip or other memory device attached to the package. In this case, the memory device may also record details of the content of the package. In this way, the contents of the package can be associated with the package itself.

Where the security unit is used for storing bank notes, a bank note validator is preferably provided for determining the denomination and authenticity of the note before this is passed to and stored in the removable package. If it is determined that the bank note is not authentic, the note is preferably rejected and not introduced into the removable package. Where the security unit is used for storing other items, the system may include a printer for printing a unique code on the item before the item is introduced to the security unit. The unique code may include details relating to the item. For example, where the item is a cheque, the code may include the value of the cheque, the transaction number to which the cheque relates, the time and date on which the cheque was received and the sort code. The identification means may comprise an optical character reader which identifies details from the item, or a decoder for reading the code printed on the item.

The removable package is preferably in the form of a bag. In this case, the bag is preferably formed from a plastics material, and more preferably from polythene. A bag of this type is relatively easy and cheap to manufacture, can be supplied flat, but is able to be expanded into the desired shape for receiving items.

According to a third aspect of the present invention, a tamper evident package comprises a plastics container having an inlet for receiving items to be collected, a neck

portion extending from the opening, and a number of fluid outlets remote from the inlet portion through which fluid introduced into the inlet is vented.

The tamper evident package according to the third aspect of the present invention is preferably used in a secure unit in accordance with the second aspect of the invention, and especially one which includes a fluid conveying means in accordance with the first aspect of the present invention. In this case, the fluid outlet allows the fluid conveying the items into the package to leave the package. If such a fluid outlet is not provided, the fluid will inflate the removable package, and prevent the flow of fluid into the package, thereby preventing the addition of further items.

The fluid outlet is preferably in the form of holes provided in the wall.

It is preferred that the fluid outlet is formed towards the upper part of the package remote from the inlet to the package. In this way, the optimum fluid flow into and through the removable package is ensured for depositing items within the package.

Preferably, the secure unit includes a heat seal system for heat sealing the removable package. Where a package in accordance with the third aspect of the present invention is used, the heat seal unit preferably welds the opposed sides of the neck of the package together to prevent unauthorised access to the package.

Alternative examples of sealing means include infra-red, chemical or vacuum sealers or pressure sensitive adhesive.

It is preferred that the seal includes some form of unique identification, for example a unique identification code,

embedded in or printed on the seal. In this way, it will be difficult for the seal to be broken and the package re-sealed without this being evident as it will be difficult to replicate the unique identification.

It is preferred that the secure unit includes a lock having a delay such that the access to the interior of the case, and in particular to the removable package is prevented for a predetermined period after an attempt is made to open the case. In this case, the heat seal unit, or other seal unit, is preferably activated in response to the attempt to open the secure unit. The sealing is beneficially completed before the unit is opened, thereby ensuring that the removable package is sealed in a tamper evident manner before this is accessible.

The unit also includes an alarm to alert any attempted, unauthorized opening. The alarm may include an audio alarm in the unit and/or a remote alarm, for example a signal may be sent to give a visual alert at a control unit.

The sealing unit preferably includes a sensor to verify that there are no items in the position where the removable package is to be sealed. This ensures that no items which are either in transit to the package, or which are stuck or jammed in the entrance to the removable package are sealed in the opening of the package. This is particularly important where the items are of paper or plastics material, and especially when the seal is a heat seal since the items will not be able to be recovered if they are sealed between the welded portions of the package.

An example of the present invention will be described in accordance with the accompanying drawings, in which:

Figure 1 shows a cross-section through a security unit;

Figure 2a shows an air-channel conveyor;

Figure 2b shows a cross-section through an opening in the air-channel conveyor;

Figure 3 shows an alternative air-channel conveyor;

Figure 4 shows an air supply system for the air channel;

Figure 5 shows a system for mounting a bag on the air channel;

Figure 6 shows a first example of a bag; and,

Figure 7 shows a second example of a bag.

The aspects of the present invention will be described with respect to a security unit which forms one example of the second aspect of the present invention, and which comprises a number of individual components, each of which may form an aspect of the invention in their own right. In particular, the unit includes a conveyor system for conveying items. The conveyor system constitutes an example of the first aspect of the present invention. The unit is also described as being provided with a bag which constitutes an example of the third aspect of the present invention. The invention also lies in the combination of two or more of the individual components of the security unit.

The security unit of the present invention will be described initially with reference to one of its preferred functions as a note handling unit, although it is understood that the unit may have other functions for different items.

The unit comprises a housing formed as a lockable metal, typically steel, case. The front 15 of the case includes a chassis on which the components of the unit are mounted. The front 15 is provided on arms (not shown) including rollers to allow the front 15 and the chassis to be removed easily to allow access to the interior of the case. The construction of the case is such that it is secure, so that

any attempt to breach the case is resisted due to the strength of the case, and any attempt to breach the case is easily apparent. An audible alarm is provided to warn of any unauthorised attempt to gain access to the unit. The case is locked by an electronic lock 14 which allows the case to be opened only after predetermined procedures have been completed as described below. The security case includes an inlet slot 16 through which notes are inserted, and a note validator 5 which receives and validates the inserted notes. The case includes a void which receives a plastics bag 7 or other package for the notes. Notes from the validator 5 are deposited in the package. When the case is opened, the bag 7 and its contents are removable from the case.

The authenticity and denomination of each note is determined by the validator 5. The validator 5 may be a conventional validator 5 such as the IDS validator available from Global Payment Technologies, Inc. A note is inserted into the validator 5, and is driven by a series of endless belt conveyors and/or rollers, past one or more note recognition devices. The validator determines parameters of the note, for example its size, colour and magnetic properties. These determined parameters are compared with predetermined acceptable ranges of parameters for notes of different denominations. Based on this comparison, the note is either rejected if it cannot be determined to be a genuine note, or accepted and its value determined. Where a note is rejected, the belts or rollers are driven in reverse to eject the note.

All accepted notes that pass through the validator 5 extend into an air channel 8, this being an example of the first aspect of the present invention. As best shown in Figure 2a, the air channel 8 comprises a generally oval channel having a width of about 90mm, a height of about 20mm and a length of about 95mm. The upper and lower faces of the air

channel 8 include an array of openings 30 which are spaced in rows extending across the width of the channel in which adjacent openings 30 are spaced by 20mm, and with adjacent rows being spaced by 10mm with a 10mm offset between openings 30 in adjacent rows. As shown in cross-section in Figure 2b, each opening 30 is formed by providing a 5mm hole though a dimple formed in the surface of the channel, the hole being formed at an angle of about 45° to the channel. The resulting openings 30 are similar to those of a cheese grater. The dimple may be formed either into the channel 8 or out of the channel 8. In the case where the dimple is formed into the channel 8, the dimple is formed behind the hole in the direction in which the note is to pass from the validator 5. In the case where the dimple is formed out of the channel 8, the dimple is formed in front of the hole in the direction in which the note is to pass from the validator 5. As shown in Figure 2b, the dimple causes air from outside the channel 8 to flow into the channel as a laminar air flow having a major component in the direction through the channel 8.

An alternative air channel 8' is shown in Figure 3. In this case, the openings comprise elongate slots 30' provided in the upper and lower faces 31',32' of the air channel 8'. A guide 33, which may be pressed out of the channel 8' to form the elongate slots 30', directs air into the channel 8' as a laminar flow generally as described above. In the following, it will be understood that either air channel 8 or 8' may be used.

As shown in Figure 4, the channel 8 is provided within a duct 9, both ends of which open to a fan or blower 10, for example a RL90-18/12NG DC radial blower available from PAPST which is able to provide a flow rate of $40m^3h^{-1}$. The duct 9 extending from each of the blowers 10 has a width of about 25mm and a depth of about 70mm giving a cross-sectional area of about $1750mm^2$. The ducts 9 from the

blowers 10 are linked by a further duct 45 having a height of around 70mm and a depth of around 70mm. The air channel 8 is provided within this duct 45. The blowers 10 blow air into the ducts 9, 45, increasing the air pressure on the outside of the channel 8. The high pressure air, typically of around 2 atmospheres, passes through the openings 30 of the channel 8 into the channel 8. Due to the angle at which the openings 30 are formed, and the dimple, the turbulent air in the duct around the channel 8 is directed as a laminar flow into the channel 8 in the direction generally away from the validator 5. As the openings 30 are formed in both the upper and lower faces 31,32 of the channel 8, there will be a component of air passing vertically upwardly and downwardly to the centre of the channel 8. This acts to maintain the note hovering near the middle of the channel 8 so the note can pass freely through the channel 8 without catching on the surfaces of the channel 8. Typically, 10 to 20% of the air flows vertically. The horizontal component of the air, the remaining 80 to 90%, facts to entrain the note and draws this from the validator 5 into the bag 7.

One or more sensors (not shown) are provided towards the end of the air channel 8 remote from the validator 5 for sensing the presence of a note within the air channel 8. The sensor may also detect the direction of movement of a note within the air channel 8. The purpose for this sensor is described below. On the outer surface of the air channel 8 at the end remote from the validator 5, there are provided two projections 41,42, the projection 42 nearest the end of the channel 8 remote from the validator 5 having an inclined surface. A sensor element 43 is provided between the two projections 41,42. This is shown in Figure 5. The projections 41,42 and sensor 43 are provided for location of a bag 7 on the air channel 8 and for ensuring the bag 7 is mounted correctly as described below.

As shown in Figure 6, the removable package comprises a generally cuboid bag 7 formed of polythene or other plastics material. The bag 7 is an example of the third aspect of the present invention. The bag 7 has a width of about 120mm, a length of about 250mm and a height of about 300mm. Such a bag 7 has a capacity of about 500 to 700 bank notes. An opening slit is provided across the upper front edge of the bag 7, and a neck 62 of about 50mm is provided from this opening. An array of holes 61 is provided on the top face of the bag 7 towards the back, and on the rear of the bag 7 towards the top. Typically, around 100 holes 61 are provided on each of the upper and rear faces of the bag 7, each hole having a diameter of about 2mm. The bag 7 is designed so that, once inflated, it assumes its generally cuboid shape, although can be flat packed for storage. The case also includes air vent holes through which air can enter the case to be driven by the blowers 10, and from which air leaves the case after leaving the bag 7. The bag 7 incudes a plastics rim 64 around the neck 62 of the bag 7 for fitting the bag 7 to an air channel 8 as described below. In an alternative arrangement, an internal removable ring may be provided to be secured to a bag 7 and fitted to the air channel 8.

An alternative bag design is shown in Figure 7. This bag is a cylindrical bag, again the an upper slit type opening with an associated neck 62' and air holes 61' provided in the upper rear of the bag 7.

The notes entrained in the air flow through the air channel 8 are transported by the air stream through the neck 62 of the bag and into the bag. As the air flow enters the large volume in the bag 7, turbulence is introduced into the laminar air flow. This turbulence causes the entrained notes to be forced towards the bottom of the bag 7. The turbulent air flow also acts to compress the notes already deposited in the bag 7 to maximise the number of notes

which the bag 7 may contain. The air then leaves the bag 7 through the holes 61 in the top and rear of the bag 7. It is important that the velocity of the air flow into the bag 7 is not too great, since this will cause a reduction in the pressure in the top part of the bag 7, and this will cause the notes in the bag 7 to lift.

The bag 7 includes a unique bar code identification mark (not shown) that is embedded in the plastics material from which it is formed. An identical bar code is embedded in a tear off strip 65 that is provided on the bag 7. This strip may be removed from the bag 7 as this is fitted and used for identification.

In an alternative embodiment, the bag 7 is provided with a memory chip which can be connected to an interface for identifying the bag. Information relating to the content of the bag, for example from the validator 5, can be written to and stored in the memory chip. This gives a record of the bag's content associated with the bag. Any attempt to remove the chip will be evident.

In use, the bag 7 is provided within the secure case by placing the bag 7 within the void in the rear section of the case, and mounting the open neck 62 of the bag 7 over the end of the air channel 8 remote from the validator 5. The neck 62 of the bag 7 is provided over the channel 8 to create an air right seal. As shown in Figure 5, the end of the air channel 8 remote from the validator 5 includes a pair of spaced projections 41,42. The projection 42 near the end of the channel 8 includes an inclined surface. In between the projections there is provided a sensor 43. As described above, the neck 62 of the bag 7 is provided with a solid member 64 which is slid over the sloped surface of the projection 42 nearest the end of the channel 8, and locates between the two projections 41,42. In this position, the presence of the solid member 64 is detected

by the sensor 43 and it is determined that the bag 7 is correctly loaded. A switch is then actuated, causing the fans to be activated and air to flow into the air channel 8 and into the bag 7. This air inflates the bag 7, causing the bag 7 to assume its cuboid arrangement. The dimensions of the bag 7 are slightly greater than the space within the case of the secure unit in which the bag 7 is provided, thereby ensuring that the bag 7 assumes the shape of the space in the case.

When the bag 7 is loaded, the identity of the bag 7 is recorded in a central unit so the payments deposited in the bag 7 may be identified. To achieve this, a bar code reader associated with the money handling unit reads the bar code embedded in the bag 7, or the bar code on the tear-off strip. In one example, a hand-held bar code reader is provided with the station, and the information is read form the embedded bar code by the reader and this information is transmitted to a memory unit in which the identified contents of the bag 7 are logged. In another example, the validator 5 doubles as a bar code reader. In this case, the tear-off strip from the bag 7 is read through the validator 5 which reads the bar code to identify the bag 7 and this information is transmitted to the memory unit. In a still further example, the bag 7 identification may be manually input to the memory unit. In any case, it is arranged that the validator 5 will not accept notes until the bag 7 has been identified to a central control unit.

As shown in Figure 1, a heat seal unit is provided to seal the open neck 62 of the bag 7 downstream of the air channel 8. The heat seal unit is a generally conventional unit, comprising two bars 11,12 which are movable with respect to each other to clamp the neck 62 of the bag 7. Both of the bars 11,12 are coated with a non-stick material, for example Teflon (Trade Mark) to ensure that the molten

plastics material of the bag 7 does not adhere to the bars 11,12. One of the bars 12 includes a heating element which is heated by a current to melt the plastics material and weld the two sides of the neck 62 of the bag 7 together. The seal unit is also able to form a unique identification in the seal to improve the security of the seal. This may be achieved by a unique pattern formed on the bars of the heat seal unit.

One of the bars 11 is pivotally mounted to allow this to be moved out of the way when a bag 7 is to be mounted on the air channel 8. One of the bars 12 is actuated by a motor 13 to drive the bars 11,12 with respect to each other to clamp the neck 62 of the bag 7. This bar 12 is moved between a rest position about 50mm from the neck 62 of the bag 7 and a seal position by the motor 13. A microswitch (not shown) is provided to detect when the bars 11,12 are clamping the neck 62 of the bag 7, and applies a current to the heater element for a predetermined period, typically 3 seconds, to weld the neck 62 of the bag 7 closed.

The secure case is locked by an electronic lock 14, including a solenoid or other magnetic element. When the key is actuated to unlock the case, before the lock is released, the heat seal unit is actuated to seal the bag 7. Only then is the case opened to allow access to the bag 7. In this way, the bag 7 is sealed to form a tamper evident package before it can be accessed, giving a high degree of security.

As will be described below, under certain circumstances, in particular where there is a note in the neck 62 of the bag 7 in the region where the bag 7 is to be sealed, it is desirable not to heat seal the bag 7. In this case, the electronic lock 14 will not allow the case to open. In this case, it is necessary for the case to be opened by an over-ride lock which is actuatable only be a person with a

high security level, for example a bank employee or a senior supervisor. The over-ride lock may be in the form of a magnetic touch key, for example a Dallas DS19xx Touch Key Memory. Such a device provides an over-ride lock that is within the casing, and which is not visible externally. Accordingly, there is no external indication of its presence and location. The lock is opened by a high security, unique passive key which interacts with the specific lock to over-ride the normal electronic lock 14 to give access to the secure unit and the unsealed bag 7 contained therein.

As previously described, the end of the air channel 8 remote from the validator 5 includes a sensor to detect the presence and direction of movement on a note within the air channel 8. The sensor may comprise a number of proximity sensors, for example a number of light emitter and detector pairs, arranged in the direction of travel of the note through the air channel 8. The presence of a note can be determined when any of the light detectors does not receive light from its associated light emitter due to a note blocking the light path between them. The direction of movement of a note can be determined by the order in which the light is blocked for the different sensors. For example, where the light is blocked first between the emitter-detector pair nearest the validator 5 and then between the pair nearest the end of the air channel 8 remote from the validator 5, it can be determined that the note is moving from the validator 5 towards the bag 7. When the light is initially blocked between all pairs, and then light is received first by the detector nearest the end of the air channel 8 remote from the validator 5 and then by the detector nearest the validator 5, it is determined that the note is moving in the direction away from the bag 7 and towards the validator 5. This may occur when a note is rejected by the validator 5, or when there is an attempt to remove notes from the secure unit.

The provision of a proximity sensor in the air channel 8 allows the system to confirm that there are no notes in the neck 62 of the bag 7 when the case is unlocked to prevent the bag 7 sealer from sealing the neck 62 of the bag 7, and sealing the note in place. The proximity sensor can also confirm that the notes leaving the validator 5 are received within the bag 7, and can confirm that no notes are jammed within the air channel 8. The system ideally records the receipt of a note within the bag 7 only when it is determined by the sensor that the note has passed through the air channel 8 and into the bag 7, rather than when the note is determined by the validator 5. The reason for this is that it is possible for a note to pass through the validator 5 and remain in the air channel 8. When a subsequent note is inserted into the validator 5, the note may be rejected for a number of reasons. However, the leading edge of the note may contact the note stuck within the air channel 8, and when the note is rejected, this may pull the jammed note from the air channel 8. Therefore, if the content of the bag 7 is determined purely on the output from the validator 5, it will be determined by the system that the note jammed in the air channel 8 and rejected with a following note will be in the bag 7, where as, in fact, the note will not be in the bag 7. By only determining that the note has entered the bag 7 after the note has been determined to have left the air channel 8, the notes in the bag 7 are determined correctly.

A note may be rejected by the validator 5 if the parameters of the note do not fall within the predetermined parameters of an acceptable note. This rejection is a function of the validator 5.

In one example of the present invention, one or more secure units are provided at each sales point to receive payments at the sales point. In this case, the secure unit includes an interface to link the unit to the EPOS system and to a

central unit. This allows determination of the content of the tamper evident packages which can save much time in balancing payments at the end of trading.

In an alternative example, a secure unit is provided for cheques in a cash room or other central location in the store. Cheques are processed in the usual manner by the sales assistant, and collected in the till drawer. The cheques are later removed from the till drawer. The cheques are then fed into the secure unit which identifies the cheques. The secure unit includes an identification means instead of the validator as described above. The identification means may be an optical character reader to read information from the cheque. However, it is preferred that the identification means is a bar code reader which reads a specially printed bar code on the cheque. The bar code includes details relating to the cheque and the transaction for which the cheque was tendered such as the amount, transaction time and number, card details etc. This bar code is printed on the reverse of the cheque by the cheque printer provided at the point of sale. The cheque is then fed to the tamper evident package in the unit, which is sealed before it can be removed. In this way, a tamper evident package containing identified cheques is produced. It will be appreciated that this arrangement can be used for other forms of payment such as credit and debit card payments and coupons.

CLAIMS

1. A conveying system comprising a channel through which items are to be conveyed, opposed side walls of the channel including a plurality of fluid inlets inclined to the angle at which the items are to be conveyed, and through which fluid from outside the channel is jetted to produce a generally laminar fluid flow through the channel which entrains an item to convey this through the channel.

2. A conveying system according to claim 1, in which the fluid jetted through the inlets is a gas.

3. A conveying system according to claim 2, in which the gas is air.

4. A conveying system according to any one of the preceding claims, in which the inlets in the channel are angled with respect to the longitudinal plane passing through the channel and to the plane normal to the channel.

5. A conveying system according to any one of the preceding claims, in which the channel has a generally oval cross-sectional channel in a plane generally normal to that along which the items are conveyed.

6. A conveying system according to any one of the preceding claims, in which the inlets are formed at an angle of about 45° to the channel.

7. A conveying system according to any one of the preceding claims, in which the inlets are formed by providing a hole though a dimple formed in the surface of the channel.

8. A conveying system according to any one of claims 1 to 6, in which the inlets comprise elongate slots extending substantially across the width of the channel.

9. A conveying system according to any one of the preceding claims, in which the channel is formed of sheet material, such as metal, and in which the inlets are formed in the flat sheet which is then bent to form the channel.

10. A security unit comprising a secure, lockable housing including an inlet for items to be stored and a removable package provided within the housing, the unit being arranged so that the removable package is sealed in a tamper evident manner before the removable package can be removed from the housing.

11. A security unit according to claim 10, further including a conveying means to convey items from the inlet to the removable package.

12. A security unit according to claim 11, in which the conveying means is in accordance with any one of claims 1 to 10.

13. A security unit according to any one of claims 10 to 12, further comprising an identification and/or validation means between the inlet and the package for identifying and/or validating items which are introduced to the package.

14. A security unit according to any one of claims 10 to 13, in which the identification and/or validation of the items is stored in a memory.

15. A security unit according to claim 14, in which the removable package is identifiable, and is associatable with

the stored identification and/or validation of the items stored in the memory.

16. A tamper evident package comprising a plastics container having an inlet for receiving items to be collected, a neck portion extending from the opening, and a number of fluid outlets remote from the inlet portion through which fluid introduced into the inlet is vented.

17. A tamper evident package according to claim 16, including fluid outlet holes provided in the wall of the package towards the upper part of the package remote from the inlet to the package.

18. A security unit according to any one of claims 10 to 15 including a tamper evident package according to claim 16 or 17.

19. A security unit according to any one of claims 10 to 15 or 18, further including a heat seal system for heat sealing the removable package.

20. A security unit according to any one of claims 10 to 15, 18 or 19, further comprising a lock having a delay such that the access to the interior of the case, and in particular to the removable package is prevented for a predetermined period after an attempt is made to open the case.

21. A security unit according to claim 20 when dependent upon claim 19, in which the heat seal unit is activated in response to the attempt to open the secure unit.

22. A security unit according to any one of claims 10 to 15 or claims 18 to 21, further comprising a sensor associated with the sealing mechanism to verify that there

are no items in the position where the removable package is to be sealed.

23. A security unit substantially as shown in or as described with respect to the accompanying drawings.

24. A tamper evident package substantially as shown in or as described with respect to the accompanying drawings.

25. A fluid conveyor substantially as shown in or as described with respect to the accompanying drawings.

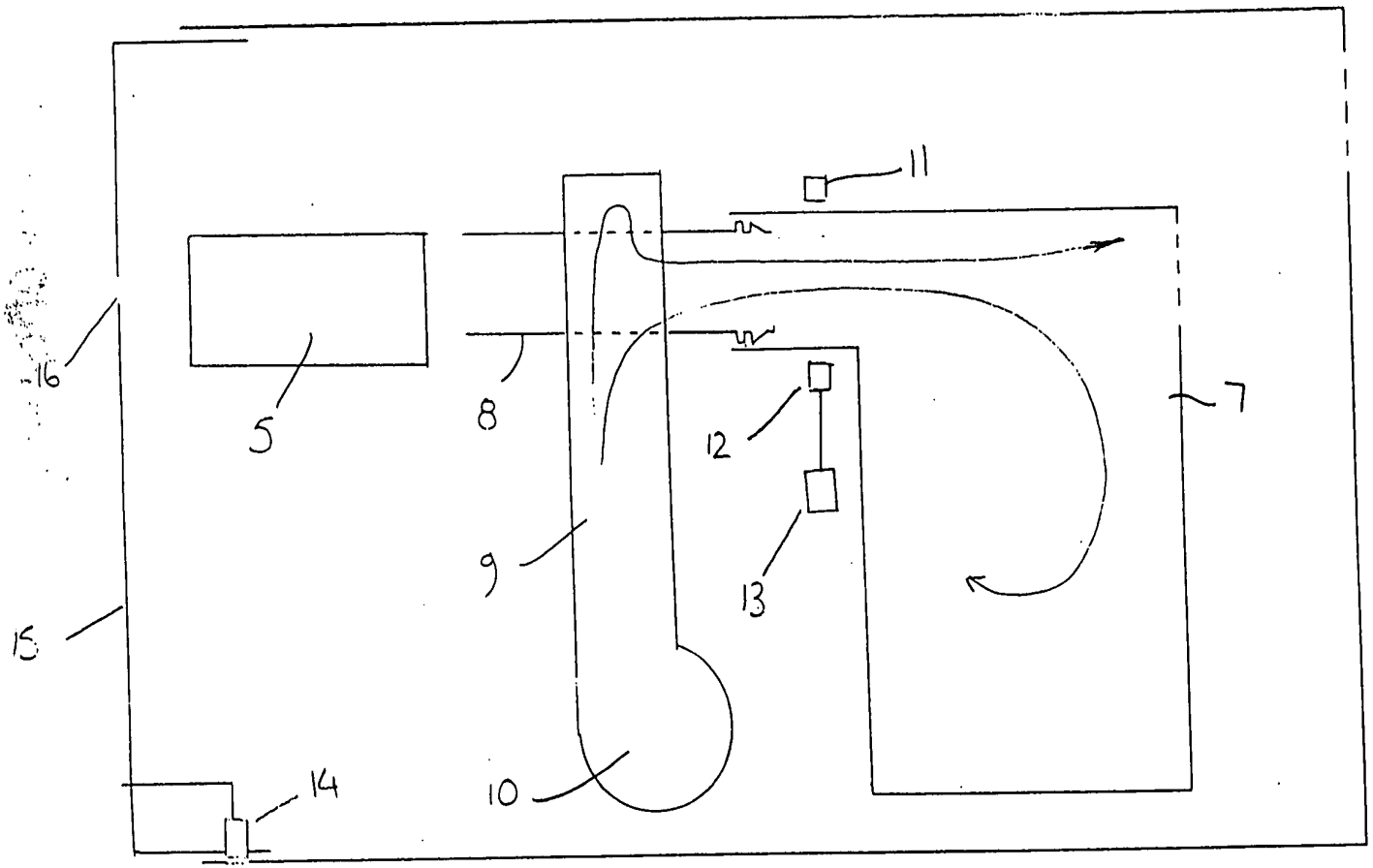

Figure 1

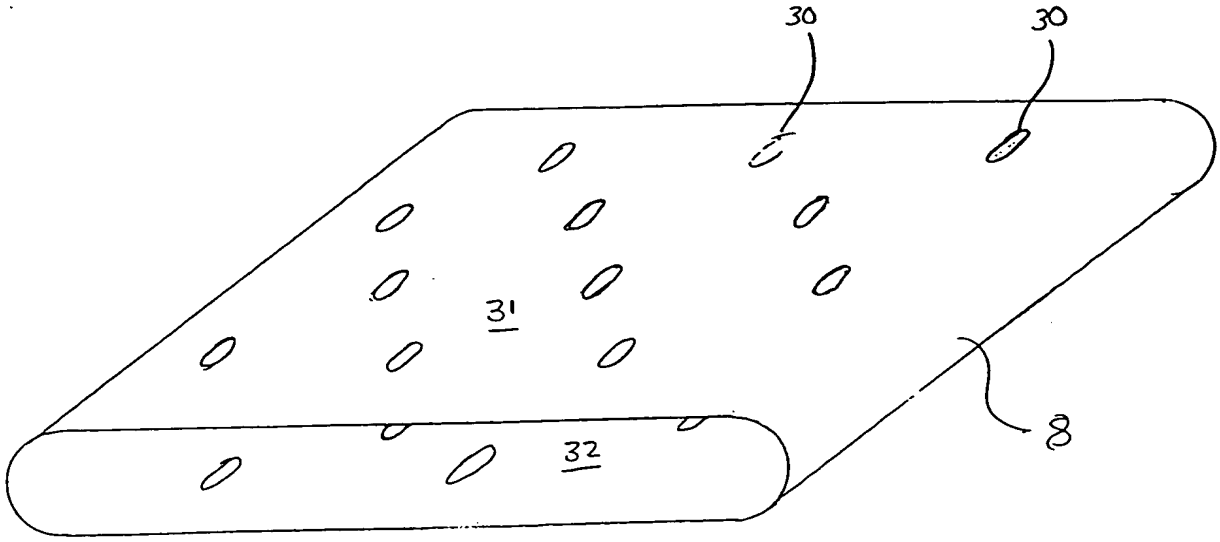

Fig 2a

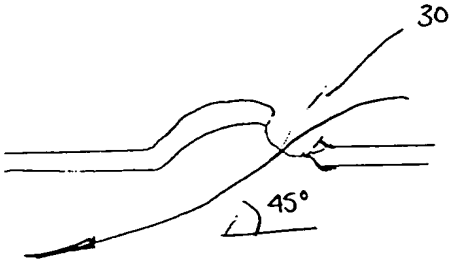

Fig 2b

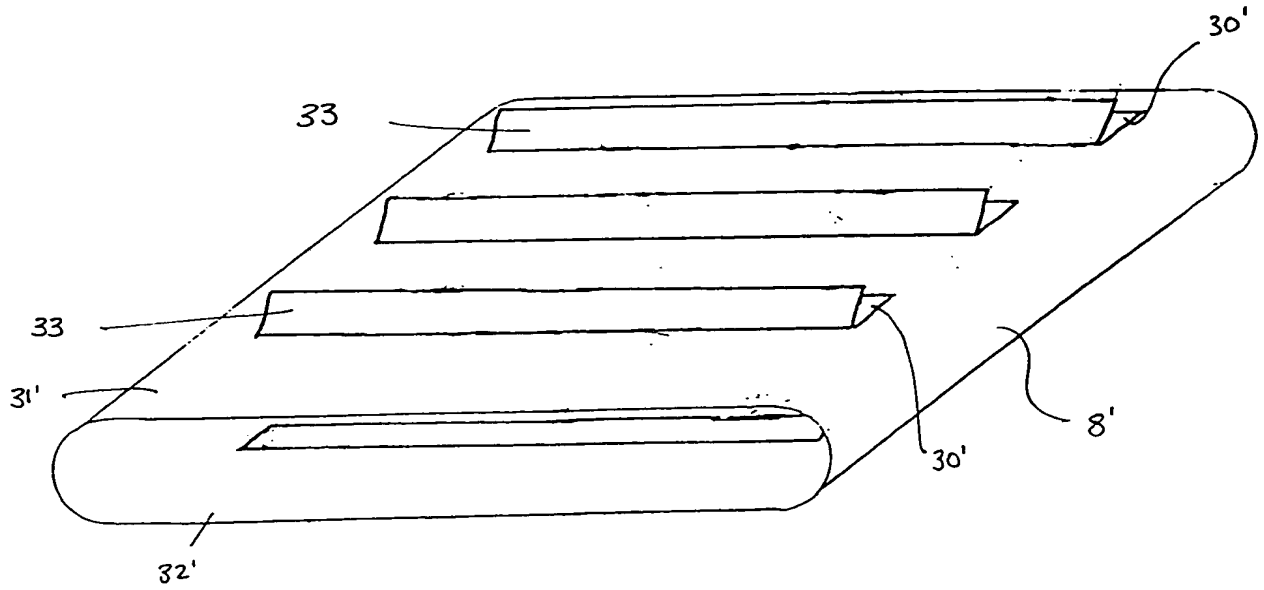

Fig 3

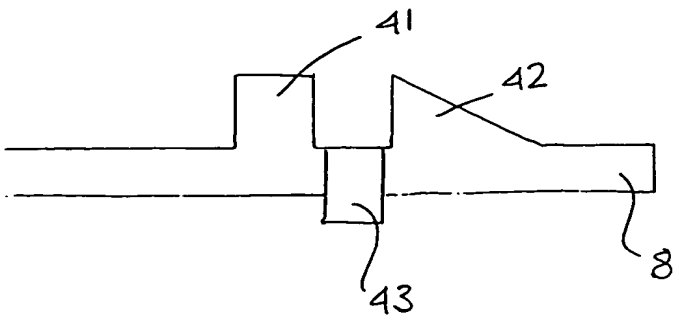

Figure 5

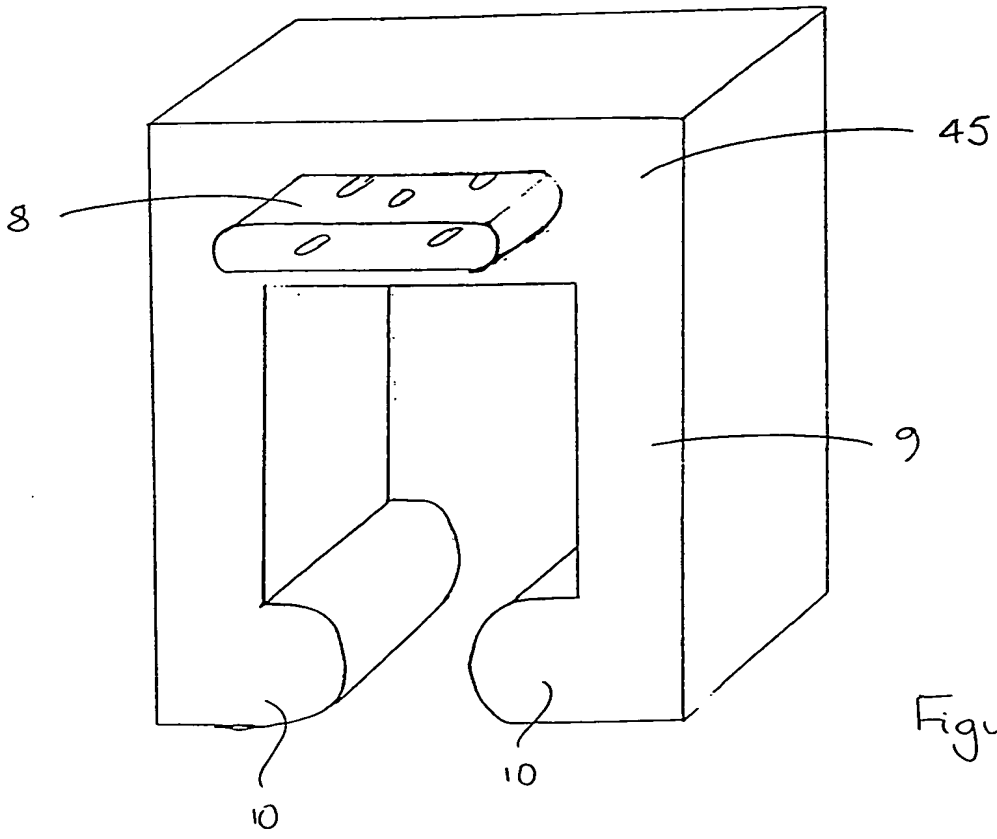

Figure 4

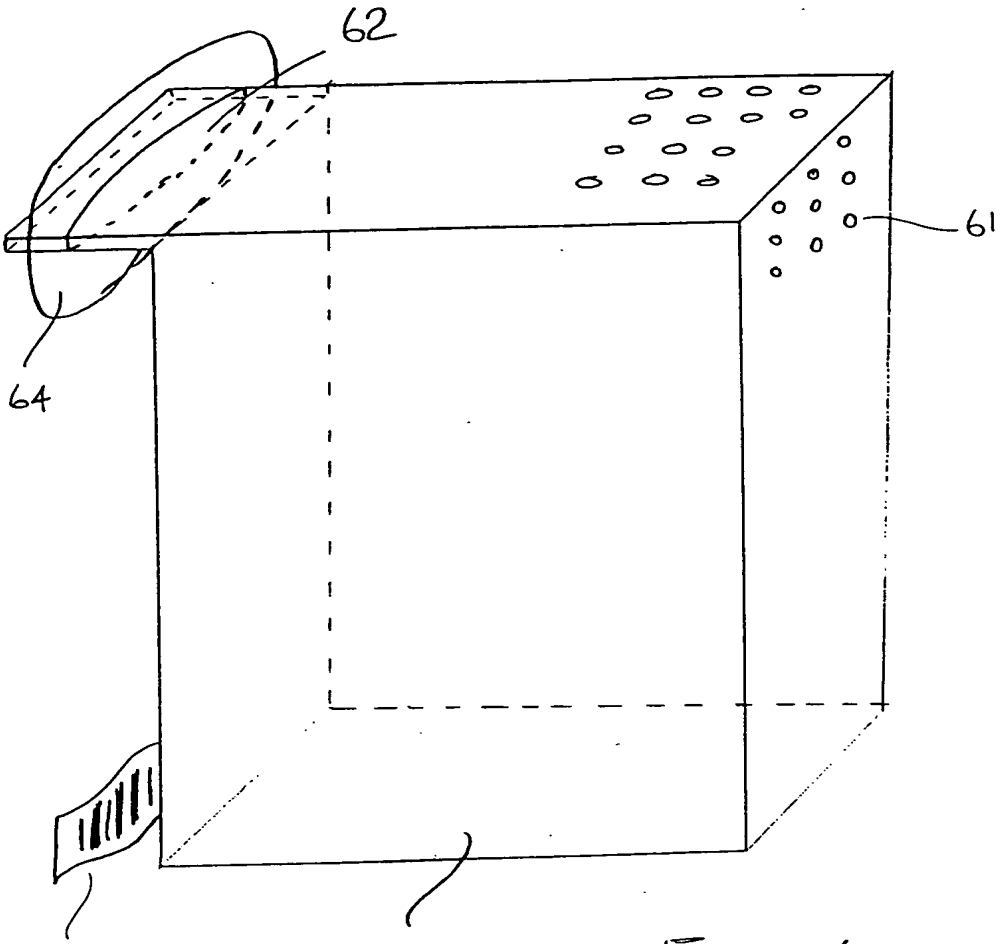

Figure 6

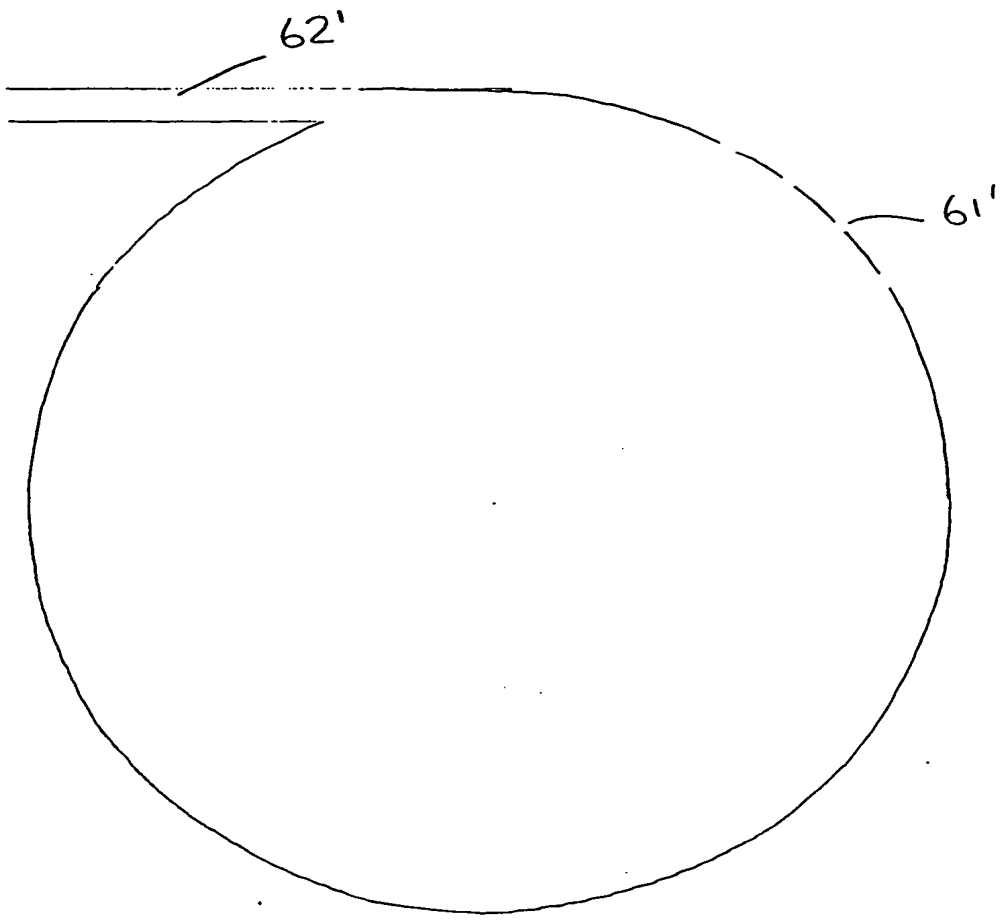

Figure 7

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